

General

Guideline Title

ACR Appropriateness Criteria® staging of testicular malignancy.

Bibliographic Source(s)

Yacoub JH, Oto A, Allen BC, Coakley FV, Friedman B, Hartman MS, Hosseinzadeh K, Porter C, Sahni VA, Sudakoff GS, Verma S, Wang CL, Remer EM, Eberhardt SC, Expert Panel on Urologic Imaging. ACR Appropriateness Criteria® staging of testicular malignancy. Reston (VA): American College of Radiology (ACR); 2016. 8 p. [70 references]

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Oto A, Yacoub JH, Casalino DD, Remer EM, Blaufox MD, Bishoff JT, Coursey CA, Dighe M, Eberhardt SC, Harvin HJ, Lazarus E, Leyendecker JR, Lockhart ME, Nikolaidis P, Porter C, Ramchandani P, Sheth S, Vikram R, Expert Panel on Urologic Imaging. ACR Appropriateness Criteria® staging of testicular malignancy. [online publication]. Reston (VA): American College of Radiology (ACR); 2012. 7 p. [69 references]

This guideline meets NGC's 2013 (revised) inclusion criteria.

Recommendations

Major Recommendations

ACR Appropriateness Criteria®

Clinical Condition: Staging of Testicular Malignancy

Variant 1: Staging testis tumor. Diagnosed by orchiectomy.

Radiologic Procedure	Rating	Comments	RRL*
CT abdomen and pelvis with IV contrast	9		⊕⊕⊕⊕
X-ray chest	8		⊕
CT chest with IV contrast	7	This procedure can be used when combined with staging abdomen and pelvis CT with IV contrast. If ordered alone (i.e., not with the CT abdomen and pelvis examination), without contrast is preferred.	⊕⊕⊕

Radiologic Procedure	Rating	Comments	RRL*
CT chest without IV contrast	7		⚠⚠⚠
MRI abdomen and pelvis without and with IV contrast	7	This procedure can be an alternative for CT with comparable performance and the added advantage of no radiation. The disadvantage is longer exam times.	O
CT abdomen and pelvis without IV contrast	6		⚠⚠⚠⚠
MRI abdomen and pelvis without IV contrast	6		O
FDG-PET/CT whole body	4	This procedure is possibly indicated for follow-up of residual or recurrent seminoma. It has no clear benefit in initial staging over CT.	⚠⚠⚠⚠
Tc-99m bone scan whole body	3		⚠⚠⚠
US abdomen and retroperitoneum	3	This procedure has variable and usually limited visualization of the retroperitoneum.	O
US scrotum	2	This procedure is essential for initial diagnosis, but is usually not useful for staging.	O
CT abdomen and pelvis without and with IV contrast	2		⚠⚠⚠⚠
CT chest without and with IV contrast	2		⚠⚠⚠
X-ray intravenous urography	1		⚠⚠⚠
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			*Relative Radiation Level

Note: Abbreviations used in the table are listed at the end of the "Major Recommendations" field.

Summary of Literature Review

Introduction/Background

Although carcinoma of the testicle is relatively uncommon, representing only 1% of all malignancies occurring in men, it is the most frequent malignancy in men between the ages of 20 and 34, accounting for 10% to 14% of cancer incidence in that age group. The National Cancer Institute estimates that there will be about 8430 new cases of testicular cancer in the U.S. and about 380 deaths from the disease in 2015.

Over 90% of testicular tumors are of germ cell origin and are malignant. Of these, 40% are seminomas. The nonseminomatous tumors are clinically more aggressive and include embryonal cell carcinoma (15% to 20%), teratoma (5% to 10%), and choriocarcinoma (<1%). Testicular cancer has an excellent prognosis, with 10-year survival rates exceeding 96%. Non-germ-cell tumors are typically benign and have their origin from the Leydig and Sertoli cells or from connective tissue stroma.

Various systems have been used for staging patients with testicular cancer, but most commonly the American Joint Commission on Cancer's system for staging and end-results reporting is used.

Testicular tumors metastasize by either the hematogenous or lymphatic route. Most follow the testicular lymphatic drainage alongside the testicular veins to regional lymph node groups. Tumors from the left testis will typically metastasize to the left para-aortic nodal group just below the left renal vein, and right testicular tumors will typically metastasize to the paracaval, precaval, and aortocaval nodes. Crossover of lymphatic involvement may occur in either right-sided or left-sided tumors; however, it is unusual to have contralateral metastasis without involvement of the ipsilateral nodes. Regional lymph node disease can further spread to nonregional lymph node groups, including common iliac, internal iliac, and external iliac nodes, or via the thoracic duct to the left supraclavicular nodes and subsequently to the lungs, constituting distant metastasis. Prior scrotal/inguinal surgery can alter the lymphatic drainage and therefore external iliac and inguinal lymph nodes are considered regional in that context.

Tumor Markers

Tumor markers such as lactate dehydrogenase, alpha-fetoprotein (AFP), and beta-human chorionic gonadotropin (β-hCG) are helpful not only in diagnosing patients with testicular tumors but in staging them as well. Approximately 90% of patients with advanced nonseminomatous tumors will have elevated levels of one or more of these markers.

AFP is elevated in approximately 50% to 70% of those with embryonal cell carcinoma, yolk sac carcinoma, or tumors of mixed composition. β-

hCG is elevated in 40% to 60% of patients with testicular cancer, including all those with choriocarcinoma, 80% of those with embryonal cell carcinoma, and 10% to 25% of those with histologically pure seminoma. An elevated AFP is never found in pure seminomas or choriocarcinomas.

Obtaining tumor markers before and after orchiectomy is also very helpful in determining whether any residual disease is present and in planning further therapy. Additionally, tumor markers are essential in the follow-up evaluation to assess both the need for and response to therapy (e.g., chemotherapy). Some patients may exhibit an elevation in serum markers at any time despite normal clinical findings and imaging studies. If causes for false-positive marker elevation are ruled out, these patients need to be treated for active disease. Significant marker elevation at presentation often portends to a worse prognosis for the patient.

A minority of patients with nonseminomatous tumors post-treatment may develop retroperitoneal masses of relatively low attenuation, which represent mature teratoma (differentiated teratoma in the British literature) rather than new or residual lymphadenopathy. This process is referred to as growing teratoma syndrome. It is a benign process; however, the tumors continue to grow over time and may result in significant morbidity due to their bulk. Mature teratoma is treated by surgical resection. Differentiation between mature teratoma and residual or recurrent lymphadenopathy may be possible by measuring serum marker levels. Treatment options may differ depending on the histology of the mass(es). Neither computed tomography (CT) nor magnetic resonance imaging (MRI) can reliably separate the two entities, which may sometimes coexist.

Overview of Imaging Modalities

Many imaging studies have been used in assessing patients with testicular tumors. In years past, intravenous urography and lymphangiography were commonly used for staging purposes; however, with the development of newer techniques the use of these imaging studies is of historical interest for this purpose. Studies used today to assess the retroperitoneum include abdominal ultrasonography (US), CT, MRI, and positron emission tomography imaging with fluorine-18-2-fluoro-2-deoxy-D-glucose (FDG-PET). Studies used to assess pulmonary disease include chest radiograph and chest CT. US continues to be used preferentially for assessing the primary tumors.

Ultrasonography Scrotum

Scrotal US is frequently used, and should always be the initial imaging modality in assessing patients with scrotal masses. This study can often differentiate fluid-filled spermatoceles and hydroceles from solid intratesticular tumors. Oftentimes, the diagnosis of a testicular mass is apparent by clinical evaluation, and US can be used for confirmation.

CT, MRI, and sometimes PET/CT are used for staging testicular cancer instead of US of the abdomen and retroperitoneum. Relative to those modalities, US of the abdomen and retroperitoneum is less reproducible due to operator dependence and frequently is nondiagnostic due to bowel gas interfering with retroperitoneal node evaluation.

Computed Tomography Abdomen and Pelvis

CT is the most common study used for assessing the retroperitoneum for the presence of metastatic testicular malignancy. It is reproducible and provides excellent imaging of the para-aortic and paracaval regions. Difficulties with CT are that many young men have little retroperitoneal fat, which tends to be an impediment to the study, and that CT cannot detect metastatic disease in lymph nodes of normal size. Additionally, inflammatory lymph nodes cannot be differentiated from those that are enlarged secondary to malignant disease.

CT interpretation is aided by understanding the lymphatic drainage of the testicles. Node involvement is usually limited to the side of the primary tumor, and crossover is usually present only in the presence of advanced disease. Various benign conditions have also been found to mimic metastases from testicular tumors. Lymph nodes >1 cm in short axis are highly suspicious for metastatic disease, particularly if they are located in the hilar regions of the kidney or in the para-aortic or caval areas. Various studies have established the accuracy of CT in detecting metastatic retroperitoneal lymph nodes, which ranges from 73% to 97%. Sensitivity ranges from 65% to 96% and specificity from 81% to 100%. Experience also indicates that accuracy declines in patients with limited disease (stage N1 and stage N2) and also if the upper limit of normal lymph node size is lowered to 4 mm. Of note, most of these studies are relatively old and were done with single-slice CT. Limited new data suggest similar accuracy with multislice CT compared to single-slice CT. It is important to recognize that a significant percentage of metastatic lymph nodes will be <1 cm, up to 60% in one series. For this reason some authors suggest using a cut-off value of 0.7–0.8 cm in testicular cancer at the expense of reduced specificity. These cut-off values are for the short-axis measurement when assessing the likelihood of nodal disease (N0 versus N1 disease); however, when assessing the nodal burden the lymph nodes should be measured in long axis (N1 versus N2 and N3 disease). For reporting purposes as regards staging, providing bidimensional measures for lymph nodes is a useful solution.

Surveillance is becoming the strategy of choice for an increasing number of patients with stage I germ cell tumor, with repeated CT imaging playing a critical role in this strategy. Due to the young age of this patient population, increasing use of CT has led to concerns regarding the increasing risk of radiation exposure. However, available data are still controversial. Studies have estimated an increased lifetime risk of cancer in patients on surveillance, based on the observed cumulative effective dose; nevertheless, in a population-based study of patients with stage I testicular cancer,

secondary malignancies of the abdomen-pelvis were found to be uncommon, and the risk of secondary cancer did not vary with the amount of diagnostic radiation exposure. The concern about radiation exposure has led to radiation reduction strategies in surveillance protocols, which no longer include chest CT, but eliminate pelvic CT except in cases where the pelvis is deemed high risk, and include the use of a low-dose multidetector CT protocol. The 2014 National Comprehensive Cancer Network guidelines have reduced the maximum number of CTs to 13 scans over 6 years.

Magnetic Resonance Imaging

MRI has also been used in the staging of testicular tumors; evidence indicates that it is comparable to CT. It can be useful in patients in whom iodinated contrast cannot be given. Diffusion-weighted imaging is a promising technique that can improve identification of lymph nodes based on degree of restricted diffusion; however, it is still limited by significant overlap between benign and malignant lymph nodes. As more attention is turned to radiation exposure in testicular cancer patients undergoing repeated cross-sectional imaging at a young age, MRI may represent an advantageous alternative to CT. The disadvantages of MRI are longer examination times, high cost, and low availability.

MRI could also be useful as a second-line investigation for preoperative evaluation of the testes when US is inconclusive, with some evidence that it can distinguish germ cell tumors from benign mimics and lymphoma and therefore may have the potential to spare a small subset of patients from getting unnecessary orchiectomies. MRI of the brain is indicated in few cases where there is clinical suspicion of brain metastases.

Chest Radiography and Computed Tomography Chest

Many studies have addressed the value of chest radiography in assessing pulmonary metastases. These studies indicate that chest radiograph alone is satisfactory in the initial staging in patients with testicular malignancies. Chest CT offers little in these patients; however, it is indicated in cases with positive abdominal CT or abnormal chest radiography. Although CT is more sensitive for detecting recurrent disease in the chest, recent studies indicate that chest radiography is sufficient for follow-up for stage I seminomas and stage I nonseminomas. In stage II and higher nonseminomas, chest CT is the study of choice, with no additional value for routine chest radiographs. There were no studies specifically addressing seminomas with retroperitoneal lymphadenopathy. Therefore, chest CT remains the study of choice for follow-up in those patients.

Positron Emission Tomography

FDG-PET has been used in assessing patients with testicular cancers, but its true value in staging patients has yet to be defined. In initial staging, PET may be only slightly more sensitive than CT. FDG-PET is superior to CT in the prediction of viable tumor in postchemotherapy seminoma residuals, and therefore it can be helpful for follow-up of patients with stage IIB, IIC, and III seminoma who have a residual mass >3 cm and normal markers. In nonseminoma, on the other hand, the value of FDG-PET is limited. It has limited predictive value for evaluation of tumor viability in the residual masses and cannot differentiate mature teratoma from necrosis or fibrosis.

Furthermore, a recent trial by the National Cancer Research Institute's Testis Cancer Clinical Studies Group using FDG-PET in an effort to predict relapse in patients with high-risk stage I nonseminomatous germ cell tumors was terminated early due to unacceptable relapse rates among PET-negative patients.

Bone Scan

Bone scans can be useful in assessing early bone lesions before they are detectable by CT, although one study suggests that FDG-PET scans are more sensitive and can substitute for conventional bone scans.

Summary

- In most instances, the diagnosis of testicular tumors is established with a carefully performed physical examination and scrotal US.
- Tumor markers are useful for determining the presence of residual disease.
- Cross-sectional imaging studies (CT, MRI) are useful in determining the location of metastases.
- FDG-PET scans have a slightly higher sensitivity than CT, but their role in staging testicular cancer has not been determined in a large study. FDG-PET may play a role in follow-up of higher-stage seminoma after chemotherapy.
- Bone scans are useful in the absence of FDG-PET scans and should be used when bone metastases are suspected.

Abbreviations

- CT, computed tomography
- FDG-PET, fluorine-18-2-fluoro-2-deoxy-D-glucose positron emission tomography
- IV, intravenous
- MRI, magnetic resonance imaging

- Tc-99m, technetium-99 metastable
- US, ultrasound

Relative Radiation Level Designations

Relative Radiation Level*	Adult Effective Dose Estimate Range	Pediatric Effective Dose Estimate Range
O	0 mSv	0 mSv
☢	<0.1 mSv	<0.03 mSv
☢ ☢	0.1-1 mSv	0.03-0.3 mSv
☢ ☢ ☢	1-10 mSv	0.3-3 mSv
☢ ☢ ☢ ☢	10-30 mSv	3-10 mSv
☢ ☢ ☢ ☢ ☢	30-100 mSv	10-30 mSv
*RRL assignments for some of the examinations cannot be made, because the actual patient doses in these procedures vary as a function of a number of factors (e.g., region of the body exposed to ionizing radiation, the imaging guidance that is used). The RRLs for these examinations are designated as "Varies."		

Clinical Algorithm(s)

Algorithms were not developed from criteria guidelines.

Scope

Disease/Condition(s)

Testicular cancer

Guideline Category

Evaluation

Clinical Specialty

Family Practice

Internal Medicine

Nuclear Medicine

Oncology

Radiology

Urology

Intended Users

Advanced Practice Nurses

Health Plans

Hospitals

Managed Care Organizations

Physician Assistants

Physicians

Students

Utilization Management

Guideline Objective(s)

To evaluate the appropriateness of imaging modalities for staging patients with testicular cancer

Target Population

Patients with testicular cancer

Interventions and Practices Considered

1. Computed tomography (CT)
 - Abdomen and pelvis with intravenous (IV) contrast
 - Abdomen and pelvis without IV contrast
 - Abdomen and pelvis without and with IV contrast
 - Chest with IV contrast
 - Chest without IV contrast
 - Chest without and with IV contrast
2. X-ray
 - Chest
 - Intravenous urography
3. Magnetic resonance imaging (MRI), abdomen and pelvis
 - Without and with IV contrast
 - Without IV contrast
4. Fluorine-18-2-fluoro-2-deoxy-D-glucose positron emission tomography (FDG-PET), whole body
5. Technetium (Tc)-99m bone scan, whole body
6. Ultrasound (US)
 - Abdomen and retroperitoneum
 - Scrotum

Major Outcomes Considered

- Utility of imaging procedures in staging of testicular malignancy
- Sensitivity and specificity of imaging procedures in detecting metastatic spread

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Description of Methods Used to Collect/Select the Evidence

Literature Search Summary

Of the 69 citations in the original bibliography, 59 were retained in the final document. Articles were removed from the original bibliography if they were more than 10 years old and did not contribute to the evidence or they were no longer cited in the revised narrative text.

A new literature search was conducted in April 2015 to identify additional evidence published since the *ACR Appropriateness Criteria® Staging of Testicular Malignancy* topic was finalized. Using the search strategy described in the literature search companion (see the "Availability of Companion Documents" field), 94 articles were found. One article was added to the bibliography. Ninety-three articles were not used due to either poor study design, the articles were not relevant or generalizable to the topic, the results were unclear, misinterpreted, or biased, or the articles were already cited in the original bibliography.

The author added 10 citations from bibliographies, Web sites, or books that were not found in the new literature search.

Number of Source Documents

Of the 69 citations in the original bibliography, 59 were retained in the final document. The new literature search conducted in April 2015 identified one article that was added to the bibliography. The author added 10 citations from bibliographies, Web sites, or books that were not found in the new literature search.

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Definitions of Study Quality Categories

Category 1 - The study is well-designed and accounts for common biases.

Category 2 - The study is moderately well-designed and accounts for most common biases.

Category 3 - The study has important study design limitations.

Category 4 - The study or source is not useful as primary evidence. The article may not be a clinical study, the study design is invalid, or conclusions are based on expert consensus.

The study does not meet the criteria for or is not a hypothesis-based clinical study (e.g., a book chapter or case report or case series description);

Or

The study may synthesize and draw conclusions about several studies such as a literature review article or book chapter but is not primary evidence;

Or

The study is an expert opinion or consensus document.

Category M - Meta-analysis studies are not rated for study quality using the study element method because the method is designed to evaluate individual studies only. An "M" for the study quality will indicate that the study quality has not been evaluated for the meta-analysis study.

Methods Used to Analyze the Evidence

Description of the Methods Used to Analyze the Evidence

The topic author assesses the literature then drafts or revises the narrative summarizing the evidence found in the literature. American College of Radiology (ACR) staff drafts an evidence table based on the analysis of the selected literature. These tables rate the study quality for each article included in the narrative.

The expert panel reviews the narrative, evidence table and the supporting literature for each of the topic-variant combinations and assigns an appropriateness rating for each procedure listed in the variant table(s). Each individual panel member assigns a rating based on his/her interpretation of the available evidence.

More information about the evidence table development process can be found in the ACR Appropriateness Criteria® Evidence Table Development document (see the "Availability of Companion Documents" field).

Methods Used to Formulate the Recommendations

Expert Consensus (Delphi)

Description of Methods Used to Formulate the Recommendations

Rating Appropriateness

The American College of Radiology (ACR) Appropriateness Criteria (AC) methodology is based on the RAND Appropriateness Method. The appropriateness ratings for each of the procedures or treatments included in the AC topics are determined using a modified Delphi method. A series of surveys are conducted to elicit each panelist's expert interpretation of the evidence, based on the available data, regarding the appropriateness of an imaging or therapeutic procedure for a specific clinical scenario. The expert panel members review the evidence presented and assess the risks or harms of doing the procedure balanced with the benefits of performing the procedure. The direct or indirect costs of a procedure are not considered as a risk or harm when determining appropriateness. When the evidence for a specific topic and variant is uncertain or incomplete, expert opinion may supplement the available evidence or may be the sole source for assessing the appropriateness.

The appropriateness is represented on an ordinal scale that uses integers from 1 to 9 grouped into three categories: 1, 2, or 3 are in the category "usually not appropriate" where the harms of doing the procedure outweigh the benefits; and 7, 8, or 9 are in the category "usually appropriate" where the benefits of doing a procedure outweigh the harms or risks. The middle category, designated "may be appropriate," is represented by 4, 5, or 6 on the scale. The middle category is when the risks and benefits are equivocal or unclear, the dispersion of the individual ratings from the group median rating is too large (i.e., disagreement), the evidence is contradictory or unclear, or there are special circumstances or subpopulations which could influence the risks or benefits that are embedded in the variant.

The ratings assigned by each panel member are presented in a table displaying the frequency distribution of the ratings without identifying which members provided any particular rating. To determine the panel's recommendation, the rating category that contains the median group rating without disagreement is selected. This may be determined after either the first or second rating round. If there is disagreement after the second rating round, the recommendation is "May be appropriate."

This modified Delphi method enables each panelist to articulate his or her individual interpretations of the evidence or expert opinion without excessive influence from fellow panelists in a simple, standardized, and economical process. For additional information on the ratings process see the [Rating Round Information](#) document.

Additional methodology documents, including a more detailed explanation of the complete topic development process and all ACR AC topics can be found on the [ACR Web site](#) (see also the "Availability of Companion Documents" field).

Rating Scheme for the Strength of the Recommendations

Not applicable

Cost Analysis

The guideline developers reviewed a published cost analysis.

Method of Guideline Validation

Internal Peer Review

Description of Method of Guideline Validation

Criteria developed by the Expert Panels are reviewed by the American College of Radiology (ACR) Committee on Appropriateness Criteria.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The recommendations are based on analysis of the current medical evidence literature and the application of the RAND/UCLA appropriateness method and expert panel consensus.

Summary of Evidence

Of the 70 references cited in the *ACR Appropriateness Criteria® Staging of Testicular Malignancy* document, 63 are categorized as diagnostic references including 12 good quality studies and 18 quality studies that may have design limitations. Additionally, 6 references are categorized as therapeutic references including 1 good quality study and 1 quality study that may have design limitations. There are 37 references that may not be useful as primary evidence. There is 1 reference that is a meta-analysis study.

While there are references that report on studies with design limitations, 13 good quality studies provide good evidence.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Selection of appropriate radiologic imaging procedures for evaluation of patients with testicular malignancy

Potential Harms

- Experience indicates that computed tomography (CT) accuracy declines in patients with limited disease (stage N1 and stage N2) and also if the upper limit of normal lymph node size is lowered to 4 mm. See the "Summary of Literature Review" section in the "Major Recommendations" field for further information.
- Due to the young age of patients with testicular malignancy, increasing use of CT for surveillance strategy has led to concerns regarding the increasing risk of radiation exposure. Studies have estimated an increased lifetime risk of cancer in patients on surveillance, based on the observed cumulative effective dose, nevertheless, in a population-based study of patients with stage I testicular cancer, secondary malignancies of the abdomen-pelvis were found to be uncommon, and the risk of secondary cancer did not vary with the amount of diagnostic radiation exposure. The concern about radiation exposure has led to radiation reduction strategies in surveillance protocols, which no longer include chest CT, but eliminate pelvic CT except in cases where the pelvis is deemed high risk, and include the use of a low-dose multidetector CT protocol. The 2014 National Comprehensive Cancer Network guidelines have reduced the maximum number of CTs to 13 scans over 6 years.

Relative Radiation Level Information

Potential adverse health effects associated with radiation exposure are an important factor to consider when selecting the appropriate imaging

procedure. Because there is a wide range of radiation exposures associated with different diagnostic procedures, a relative radiation level (RRL) indication has been included for each imaging examination. The RRLs are based on effective dose, which is a radiation dose quantity that is used to estimate population total radiation risk associated with an imaging procedure. Patients in the pediatric age group are at inherently higher risk from exposure, both because of organ sensitivity and longer life expectancy (relevant to the long latency that appears to accompany radiation exposure). For these reasons, the RRL dose estimate ranges for pediatric examinations are lower as compared to those specified for adults. Additional information regarding radiation dose assessment for imaging examinations can be found in the American College of Radiology (ACR) Appropriateness Criteria® Radiation Dose Assessment Introduction document (see the "Availability of Companion Documents" field).

Qualifying Statements

Qualifying Statements

- The American College of Radiology (ACR) Committee on Appropriateness Criteria and its expert panels have developed criteria for determining appropriate imaging examinations for diagnosis and treatment of specified medical condition(s). These criteria are intended to guide radiologists, radiation oncologists, and referring physicians in making decisions regarding radiologic imaging and treatment. Generally, the complexity and severity of a patient's clinical condition should dictate the selection of appropriate imaging procedures or treatments. Only those examinations generally used for evaluation of the patient's condition are ranked. Other imaging studies necessary to evaluate other co-existent diseases or other medical consequences of this condition are not considered in this document. The availability of equipment or personnel may influence the selection of appropriate imaging procedures or treatments. Imaging techniques classified as investigational by the U.S. Food and Drug Administration (FDA) have not been considered in developing these criteria; however, study of new equipment and applications should be encouraged. The ultimate decision regarding the appropriateness of any specific radiologic examination or treatment must be made by the referring physician and radiologist in light of all the circumstances presented in an individual examination.
- ACR seeks and encourages collaboration with other organizations on the development of the ACR Appropriateness Criteria through society representation on expert panels. Participation by representatives from collaborating societies on the expert panel does not necessarily imply individual or society endorsement of the final document.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

Living with Illness

IOM Domain

Effectiveness

Identifying Information and Availability

Bibliographic Source(s)

Yacoub JH, Oto A, Allen BC, Coakley FV, Friedman B, Hartman MS, Hosseinzadeh K, Porter C, Sahni VA, Sudakoff GS, Verma S, Wang CL, Remer EM, Eberhardt SC, Expert Panel on Urologic Imaging. ACR Appropriateness Criteria® staging of testicular malignancy. Reston (VA): American College of Radiology (ACR); 2016. 8 p. [70 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2016

Guideline Developer(s)

American College of Radiology - Medical Specialty Society

Source(s) of Funding

American College of Radiology (ACR) provided the funding and the resources for these ACR Appropriateness Criteria®.

Guideline Committee

Committee on Appropriateness Criteria, Expert Panel on Urologic Imaging

Composition of Group That Authored the Guideline

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Financial Disclosures/Conflicts of Interest

Not stated

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Oto A, Yacoub JH, Casalino DD, Remer EM, Blaufox MD, Bishoff JT, Coursey CA, Dighe M, Eberhardt SC, Harvin HJ, Lazarus E, Leyendecker JR, Lockhart ME, Nikolaidis P, Porter C, Ramchandani P, Sheth S, Vikram R, Expert Panel on Urologic Imaging. ACR Appropriateness Criteria® staging of testicular malignancy. [online publication]. Reston (VA): American College of Radiology (ACR); 2012. 7 p. [69 references]

This guideline meets NGC's 2013 (revised) inclusion criteria.

Guideline Availability

Available from the [American College of Radiology \(ACR\) Web site](#) .

Availability of Companion Documents

The following are available:

- ACR Appropriateness Criteria®. Overview. Reston (VA): American College of Radiology; 2015 Oct. 3 p. Available from the [American College of Radiology \(ACR\) Web site](#) .
- ACR Appropriateness Criteria®. Literature search process. Reston (VA): American College of Radiology; 2015 Feb. 1 p. Available from the [ACR Web site](#) .
- ACR Appropriateness Criteria®. Evidence table development. Reston (VA): American College of Radiology; 2015 Nov. 5 p. Available from the [ACR Web site](#) .
- ACR Appropriateness Criteria®. Topic development process. Reston (VA): American College of Radiology; 2015 Nov. 2 p. Available from the [ACR Web site](#) .
- ACR Appropriateness Criteria®. Rating round information. Reston (VA): American College of Radiology; 2015 Apr. 5 p. Available from the [ACR Web site](#) .
- ACR Appropriateness Criteria®. Radiation dose assessment introduction. Reston (VA): American College of Radiology; 2015 Sep. 3 p. Available from the [ACR Web site](#) .
- ACR Appropriateness Criteria®. Manual on contrast media. Reston (VA): American College of Radiology; 2016. 128 p. Available from the [ACR Web site](#) .
- ACR Appropriateness Criteria®. Procedure information. Reston (VA): American College of Radiology; 2016 May. 2 p. Available from the [ACR Web site](#) .
- ACR Appropriateness Criteria® staging of testicular malignancy. Evidence table. Reston (VA): American College of Radiology; 2016. 25 p. Available from the [ACR Web site](#) .
- ACR Appropriateness Criteria® staging of testicular malignancy. Literature search. Reston (VA): American College of Radiology; 2016. 1 p. Available from the [ACR Web site](#) .

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI on March 7, 2006. This summary was updated by ECRI Institute on December 5, 2007. This summary was updated by ECRI Institute on June 18, 2010. This summary was updated by ECRI Institute on January 13, 2011 following the U.S. Food and Drug Administration (FDA) advisory on gadolinium-based contrast agents. This summary was updated by ECRI Institute on November 6, 2012. This summary was updated by ECRI Institute on September 29, 2016.

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